The Napa River

Benthic Macroinvertebrate Project

Contributors:

- C. Dewberry, ICARE, Project Consultant
- Chris Malan, ICARE, Project Manager
- GIS Information, Jonathan Koehler, RCD and Josh Malan, ICARE
- Photos:
  - Lowell Downey, Art and Clarity
  - Chris Malan
  - Todd Adams

Napa River Macro-invertebrate Study 2000-2004

- San Francisco Estuary Project
- State Water Resources Control Board
- The Mennen Environmental Foundation
- California Regional Water Quality Control Board
- The Giles W. and Elise G. Mead Foundation
- Walmart
- National Fish and Wildlife Foundation
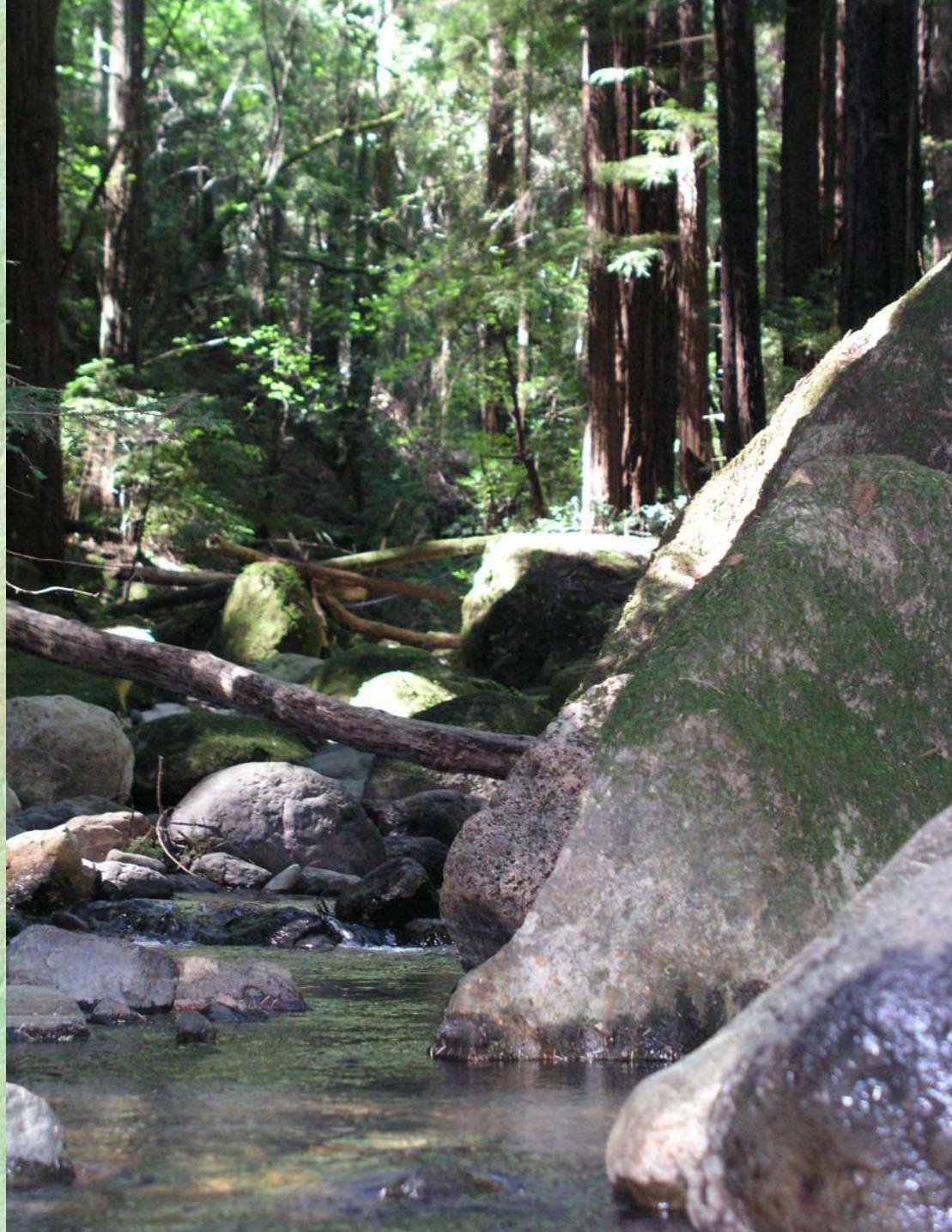- The San Francisco Foundation
- Ecotrust

Napa River Watershed 2004

Conceptual Framework for IBI

- Natural Variability-
- Physical setting
  - Geology
  - Climate
- Biological
  - Existing Communities
  - Immigration
  - Emigration
  - Extinction

- Management Activities-
- Development
  - Agricultural
  - Suburban/urban
  - Water Resources
  - Recreational

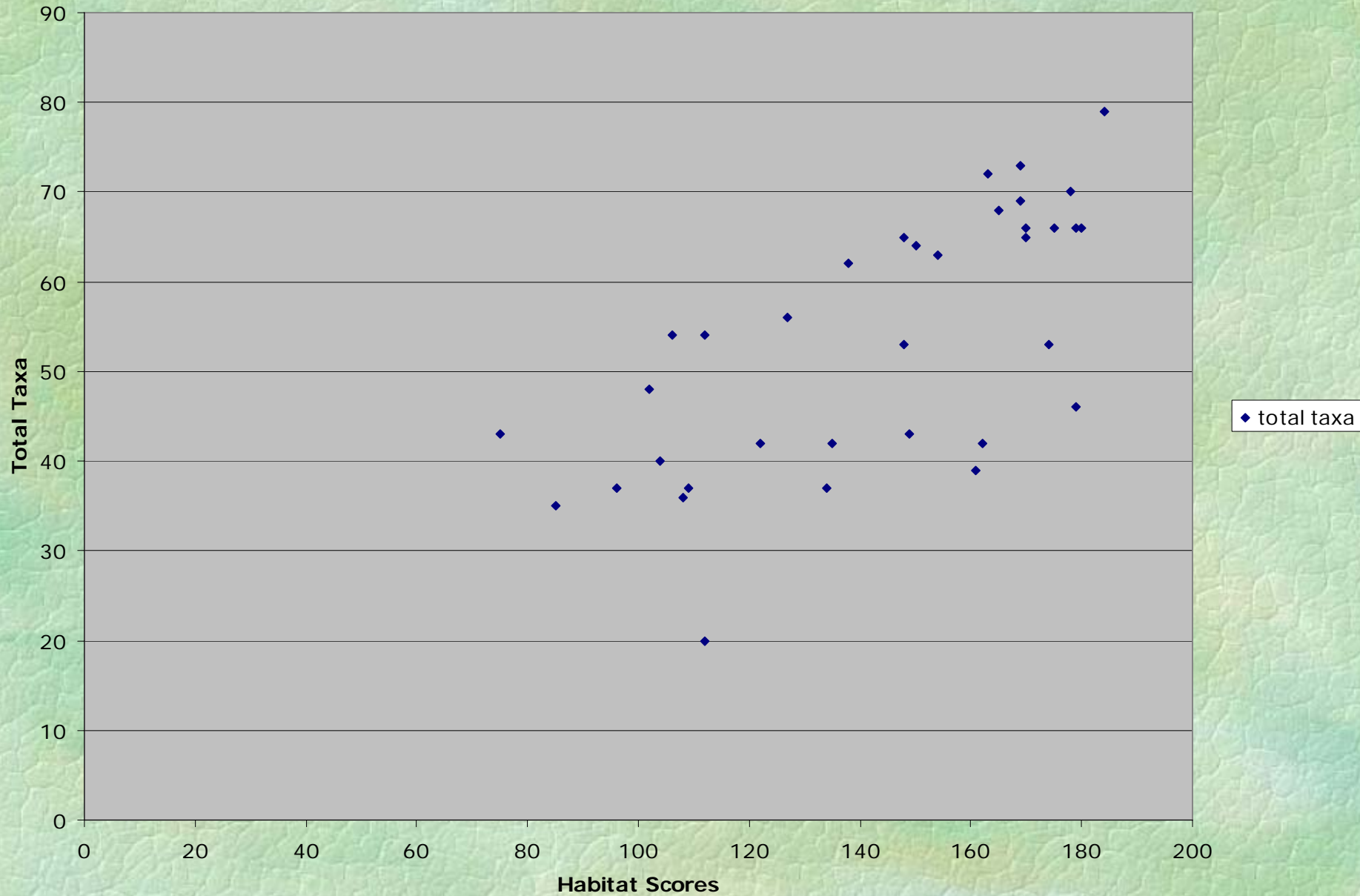Table 1. Number of Samples Collected in the Napa Basin 2000-2004.

Year	# of Samples
2000	33
2001	31
2002	40
2003	34
2004	35

Figure 2. Relationship of Total Taxa and Habitat score for the Napa basin 2004

Average Taxa Richness for Napa Basin 2000-2004.

- 2000   63
- 2001   59
- 2002   49
- 2003   45
- 2004   54

Table 11. Average Habitat Scores from the Napa Basin 2000-2004.

Year	Habitat Score
2000	138.2
2001	149.3
2002	136.6
2003	138.6
2004	142.6

Comparison of Reference Sites

- Ritchey Creek
- 2000   71
- 2001   79
- 2002   79
- 2003   62*
- 2004   66

- Mill Creek
- 2000   74
- 2001   78
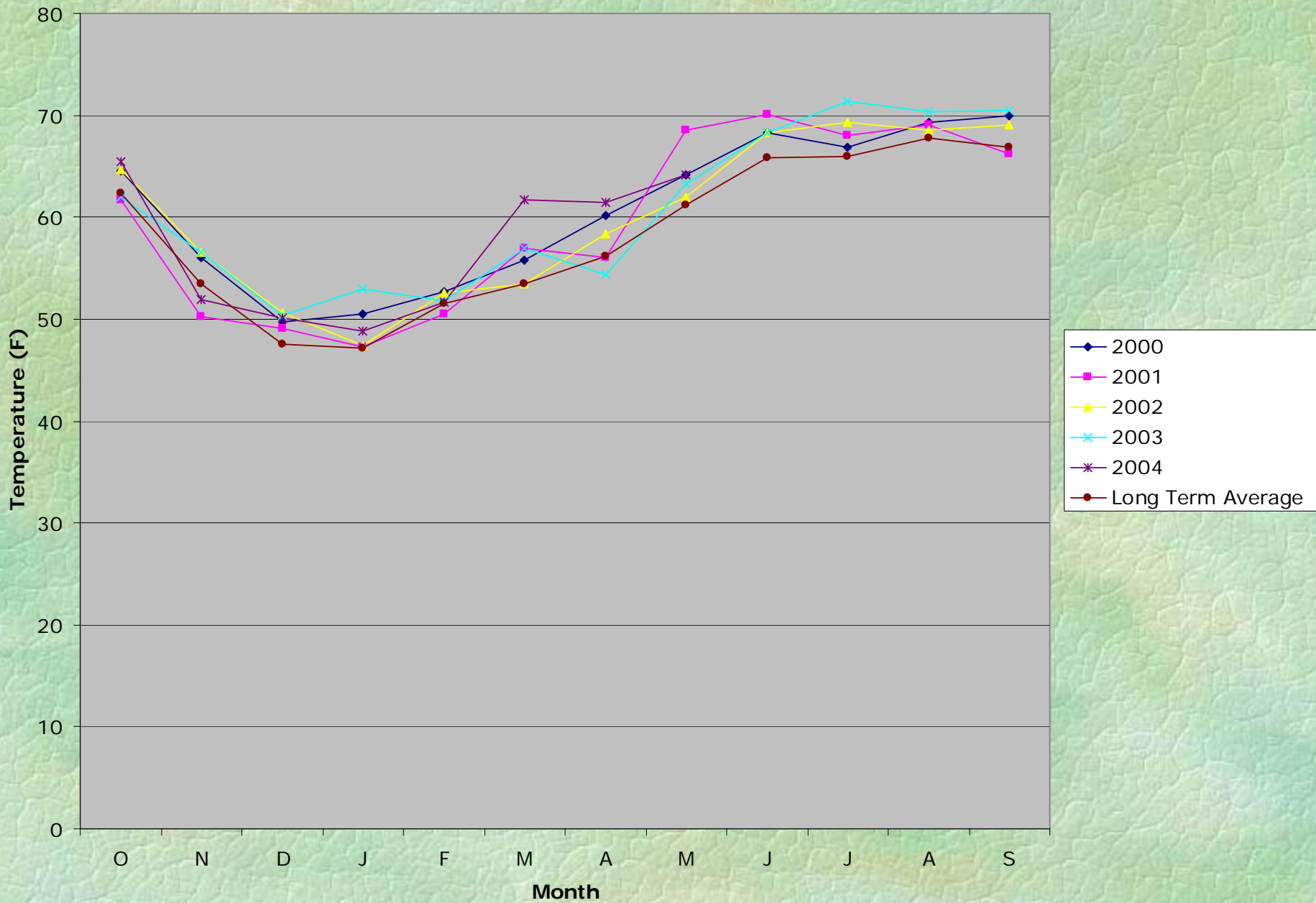- 2002   71
- 2003
- 2004   66

Figure 8. Average Monthly Temperature for Napa Basin (2000-04).

Figure 9. Average Monthly Precipitation for Napa Basin (2000-04).

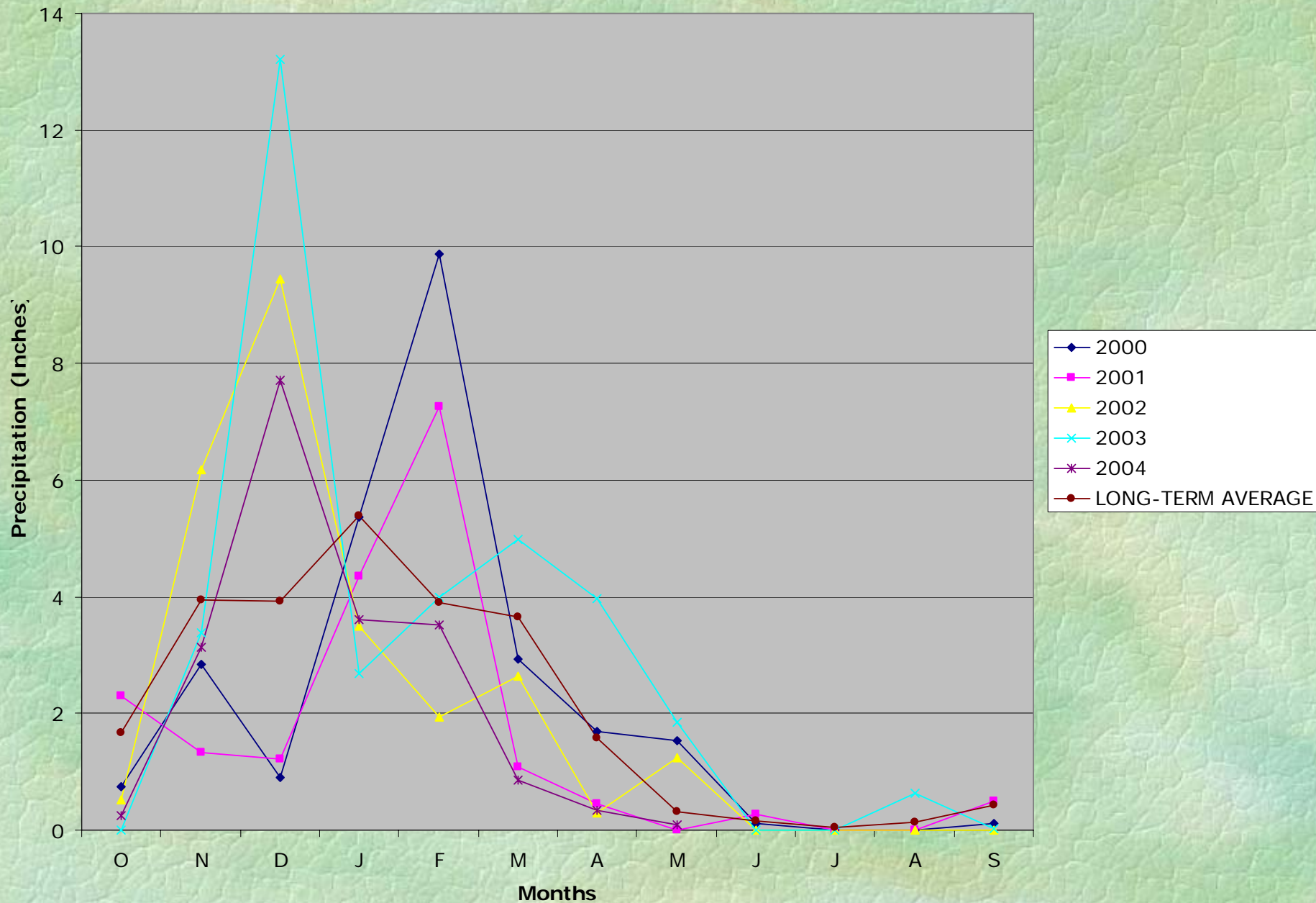## Table 14.Daily Maximum Precipitation from Napa State Hospital, CA (2000-2004)

Year	Date	Max Daily
2000	24-Jan	2.39
2001	11-Jan	1.05
2002	29-Nov	1.92
2003	14-Mar	3.3
2004	1-Jan	2.2

Table 15. Cumulative Land Use Activity and Biological Response for the Napa Basin (2000,2001, and 2004)			
Class I Undeveloped	**Class II** Some	**Class III** predom ag.	**Class III** predom sul
21	25	9	13
21	22	21	9
25	16	9	15
25	23	25	9
25	25	19	11
25	21	21	17
25	21	11	9
23	15	13	9
25	25	13	11
25	25	13	17
23	21	17	9
25	21	13	9
25	15	11	11
25		5	
		21	
		13	
		13	
		17	
		13	
		11	
		5	
		21	
24.14286	21.15385	14.27273	11.46154
	(15% reduction)	(50% reduction)	(65% reduc

Blind Spot

- We collected stream flow measurements at the time of sampling.

- However, if the stream was dry we selected another site.

- We are currently working on building a historical picture of stream flow.

Conclusions

- Macro-invertebrate richness is high and the range is large, therefore an IBI will be sensitive.

- Taxa richness was highly variable between years.

- It is difficult to separate out the components of the variation at this point.

- We need a couple of poor reference sites.

- We did not build in the most important component stream flow into the analysis.

The End